


Notes - Transformations of Functions

$$a f(b(x-c)) + d$$

a : in front outside multiplied
 b : inside multiplied
 $x-c$: inside added
 d : outside added

a: If $a < 0$ ^{negative}, reflect over x-axis 


If $|a| > 1$, vertical stretch 
 ignore any negatives!

If $|a| < 1$, vertical shrink 

b: If $b < 0$, reflect over y-axis 

If $|b| > 1$, horizontal shrink
 compression 

If $|b| < 1$, horizontal stretch 

c: If $c > 0$, shifts right
 after you pull it out 

If $c < 0$, shifts left 

d: If $d > 0$, shifts up 

If $d < 0$, shifts down 